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Tutorials for “Decision Procedures SS19”
Exercise sheet 7

Exercise 7.1:

Consider the timed automaton $T = (\{l_0, l_1, l_2, l_3\}, l_0, \{x\}, \{\text{inv}_l\}, E)$ where

$$\begin{aligned}\text{inv}_{l_0} &= x \leq 1 \\ \text{inv}_{l_1} &= x \leq 100 \\ \text{inv}_{l_2} &= x \leq 100 \\ \text{inv}_{l_3} &= x \leq 100\end{aligned}$$

and edges E consisting of

$$\begin{aligned}(l_0, x = 1, \emptyset, l_1) \\ (l_1, x \leq 99, \emptyset, l_3) \\ (l_1, x > 99, \emptyset, l_2) \\ (l_3, x \leq 100, \emptyset, l_1) \\ (l_2, \top, \{x\}, l_1).\end{aligned}$$

1. Construct the FOL(LA) clauses out of T .
2. (Dis)Prove via SUP(T) that location l_3 can be reached with clock value $x = 42$.
3. (Dis)Prove via SUP(T) that there is no state reachable with $x > 100$.